

REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 11-14 will be active in the application subsequent to entry of this Amendment.

A typing error in the Abstract has been corrected and units for the MFR₂₁ measurement are included in claims 11 and 13.

Claim 14 has been added directed to a preferred aspect of the disclosure namely a blow molded bimodal HDPE container having a specified volume and ESCR value which consists of, as the polymer component, the ethylene homopolymer of the requisite characteristics. The container will also include the usual standard polymer additives, etc., but consists of the specified ethylene homopolymer as the polymer component. The significance of this claim is discussed in the remarks that follow.

The main issue raised in the outstanding Official Action, apart from the typing error and claim adjustments mentioned above, is the rejection of all of the previously pending claims based on a newly cited reference taken in combination with five other documents. In total then there is a combination of six separate references that have been combined together and cited against applicants' claims. As the courts have stated, the fact that it is necessary to cite such a large number of references is, in and of itself, indicative of non-obviousness. *Minneapolis-Honeywell Regulator Company v. Midwestern Instruments, Inc.*, 298 F.2d 36, 38, 131 U.S.P.Q. 402, 403 (7th Cir. 1961).

The examiner's assumption that the subject matter of the various claims was commonly owned at the time the inventions were made is correct. The inventors' employer and the assignee is Borealis Technology Oy.

The search for thought-to-be-relevant applied prior art has gone far and wide and in applicants' view into areas not relevant and not normally considered when one sets out to prepare a polyethylene container of at least 8 meter volume having the requisite ESCR value. Indeed, much of the art relates more to different objects which have different characteristics and requirements.

To establish a case of *prima facie* obviousness, all of the claim limitations must be taught or suggested by the prior art. See M.P.E.P. § 2143.03. A claimed invention is unpatentable if the differences between it and the prior art are such that the subject matter as a whole would have

been obvious at the time the invention was made to a person having ordinary skill in the art. *In re Kahn*, 78 USPQ2d 1329, 1334 (Fed. Cir. 2006) citing the legal standard provided in *Graham v. John Deere*, 148 USPQ 459 (1966). The *Graham* analysis needs to be made explicitly. *KSR v. Teleflex*, 82 USPQ2d 1385, 1396 (2007). It requires findings of fact and a rational basis for combining the prior art disclosures to produce the claimed invention. *See id.* (“Often, it will be necessary for a court to look to interrelated teachings of multiple patents . . . and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue”). The use of hindsight reasoning is impermissible. *See id.* at 1397 (“A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning”). Thus, a *prima facie* case of obviousness under Section 103(a) requires “some rationale, articulation, or reasoned basis to explain why the conclusion of obviousness is correct.” *Kahn*, 78 USPQ2d at 1335; *see KSR*, 82 USPQ2d at 1396. A claim which is directed to a combination of prior art elements “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *Id.* at 1396. Finally, a determination of *prima facie* obviousness requires a reasonable expectation of success. *See In re Rinehart*, 189 USPQ 143, 148 (C.C.P.A. 1976).

Applicants now address the examiner’s comments including the newly cited reference.

Morimoto has been replaced by Debras as the primary reference. Debras describes the formation of various bimodal polymers and the MFR₂₁, density and MWD ranges in Debras falling within the ranges in claim 11. It is worth noting however, that none of the Examples in Debras have the necessary parameters. All the examples have an MFR₂₁ that is too high and a MWD that is too low. Note also that achieving an Mw with the range of 250,000 to 350,000 is difficult.

Debras is applied under 35 USC §103(a) however so it is worthwhile noting what problem Debras tries to solve. The answer is that Debras tries to provide bimodal polymers for the manufacture of pipes. Pipes are the only application suggested for the bimodal polymers of Debras.

The present invention is explicitly for the manufacture of large moulded containers. In a blow moulding operation a heated parison is expanded to contact the interior surface of a mould

by the action of pressurized gas or by the application of a vacuum. The heated polymer must be able to stretch smoothly to produce a satisfactory uniform skin in contact with the mould surface.

Pipe extrusion is a rather different process and polymers designed for pipe applications are not traditionally used to manufacture blow moulded articles as the requirements for each application are different. Pipes for example operate under high internal pressures so a crucial pipe parameter is performance under a notched pressure test. Blow moulded containers are not used under pressure. For a blow moulded article, impact resistance is important as the container might be dropped or something dropped on it. A pipe however is fixed and normally underground where it cannot be dropped and nor can anything be dropped on it. The requirements therefore of these materials are very different.

The point here is that no-one looking to manufacture large blow moulded articles starts from the Debras prior art. It does not disclose blow moulded articles. The first question to ask therefore is why does the skilled man come across Debras in the first place given he is manufacturing blow moulded articles. The second question is even if he does find it, why does the skilled man consider it given it is about pipes?. Why would he want to take the polymers of Debras suggested for pipe applications and use them to manufacture blow moulded articles? Where is the motivation to do that?.

But consider in more detail the polymers Debras actually discloses. Debras describes a multistage loop polymerization process for the manufacture of a bimodal polyethylene polymer. The first component is an ethylene homopolymer and the second component does seem to be a copolymer, e.g. with hexene. The properties of the final polymer are given at the bottom of column 4 and they have the necessary MFR₂₁ density and MWD (just) that applicants claim. The range in Debras is 10 to 20 which just overlaps (by 3) with the 18 to 50 range in claim 11.

Debras does not consider the environmental stress crack resistance or ESCR properties of the polymers it describes and this is very important. The main purpose of the claimed invention was to provide large blow moulded articles with high ESCR. That is stated as an object of the invention on page 2 of the application as filed. As Debras does not even consider ESCR and considers polymers for use in pipes, there is no way that Debras discloses the formation of large blow moulded articles as claimed in the instant application

The high ESCR value is a factor of the very narrow parameter ranges in claim 11.

Applicants carefully specify narrow ranges for Mw, Mn and comonomer content especially and Debras does not mention anywhere the comonomer content of the polymers it makes. Nowhere then is there any incentive or motivation in Debras to manufacture a polymer with a comonomer content as now claimed.

The Examiner notes that various parameters are missing from the Debras disclosure so goes searching for them in other prior art documents in particular Harlin and Barry. Again, the references to McWhorter and Suttoni are ignored as the size of the container is not independently patentable and applicants do not assert that 8L blow moulded containers are generically new. The need to cite the Page reference is not seen as Debras has Mw and Mn values in its examples. The use of the conversion factors in Page is unnecessary therefore as Debras provides these figures directly.

Barry is entitled "Premium pipe resins" (the same deficiency and lack of relevance as Debras) which gives the reader some indication that this document too is primarily about pipe not blow moulding. The Examiner relies on Barry to allege that the comonomer content in claim 11 is obvious. Applicants do not see, however, where the comonomer content is mentioned in the passages highlighted by the Examiner or why these passages teach optimization of the comonomer content, to, *inter alia*, maximize ESCR.

At best Barry teaches control of comonomer incorporation but in column 4, line 4, the amount of comonomer can be up to 30wt/%. There is no teaching whatsoever to operate at levels of 1 to 2 wt%. Note also that Barry describes the use of a bimetallic catalyst to make its polymers. It uses therefore a catalyst with two active centers to form in a single stage a bimodal material, each component of the catalyst contributing a different polymer. In such a process it is impossible to produce an ethylene homopolymer/copolymer mixture. In a single stage process such as that taught by Barry you either use comonomer or you do not. If you use it you get two copolymers, if you do not, you get two homopolymers. It is impossible to make one catalyst component form a copolymer while the other forms a homopolymer using a bimetallic catalyst.

While it is appreciated that such a homopolymer/copolymer mixture is discussed at the bottom of column 3, the reality is that the Barry disclosure does not enable such a composition.

Note also that Barry does not mention ESCR or tensile modulus, two other parameters which are not mentioned in Debras either. The combination therefore of Barry and Debras is not

a convincing one.

Harlin is perhaps more relevant but before considering the combination of Harlin and Debras we must firstly consider why this combination would be made at all. Remember that the present invention concerns large blow moulded containers which exhibit remarkable properties. The alleged closest prior art concerns similar (although by no means identical) polymers for the manufacture of pipes. There is no teaching in Harlin towards the manufacture of large blow moulded containers either and the combination of Harlin and Debras does not seem therefore to be one which the skilled man would make. If he did, note that Harlin mentions pipes so presumably this combination would, at best, lead the reader to alternative pipe polymers. The jump from the pipe polymers of Debras to large blow moulded articles is not made any easier by Harlin. Note also that the polymer solution offered by Harlin is a blend of a bimodal polymer and a unimodal polymer and is a very different solution to that offered either by Debras or by the claimed invention.

Looking at the Harlin disclosure, while it mentions optimization of the comonomer content and notes that this can be important, there is no disclosure in the description of the level of comonomer to optimize too. The reference in column 3, line 64 to comonomer content (which the Examiner highlights) refers to the amount of comonomer in the unimodal copolymer which forms part of the blend in Harlin not the amount of comonomer in the bimodal polymer.

Note also that the solution in Harlin is different from that in Debras. The Harlin solution involves a blend of a bimodal polymer with a unimodal copolymer -- a blend. The second component is added to improve ESCR. The present inventors have found that the addition of this component is not necessary and high levels of ESCR can be achieved by using carefully controlled parameters as claimed in claim 11.

Applicants comment on the argument at the end of the Office Action that if a prior reference polymer has the same Mw, Mn, MWD, MFR2l and so on then it is also considered to possess the necessary ESCR, comonomer content and tensile properties even if these are not quoted, Applicants point out that no document does have all the necessary parameters as no document is raised under 35 USC §102. There is certainly no disclosure of the necessary polymer in the context of a large blow moulded container.

New independent claim 14 has been added directed to a container "consisting of" the specified polymer, i.e. so that the specified polymer is the only polymer component present. These containers will obviously also contain standard polymer additives. This distinguishes further over the blends of Harlin.

The combination of the six patents do not render obvious the claimed invention because all limitations of independent claims 11, 13 and 14 are not fairly taught or suggested in the cited patents. Moreover, claim 12 depending from independent claim 11 is also not made obvious by the documents because the limitations of an independent claim are incorporated in their dependent claims. M.P.E.P. § 2143.03 citing *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988).

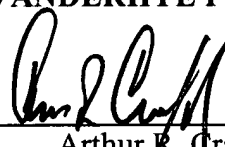
Withdrawal of the Section 103 rejection is requested because the claimed invention would not have been obvious to the ordinarily skilled artisan at the time Applicants made their invention.

Having responded to all of the pending rejections contained in the Office Action, Applicants submit that the claims are in condition for allowance and earnestly solicit an early Notice to that effect. The Examiner is invited to contact the undersigned if any further information is required.

Respectfully submitted,

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